Aug. 2, 1927. 1,637,377

A. HEICKE

PELLET FORMING APPARATUS

Filed Jan. 22, 1926 2 Sheets-Sheet 1

Fig. 1.

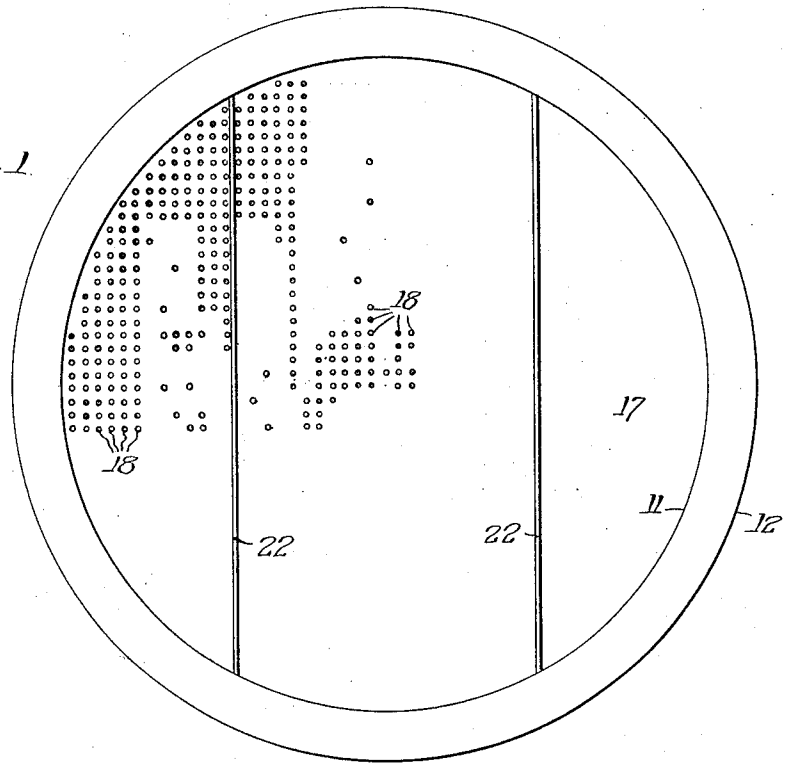
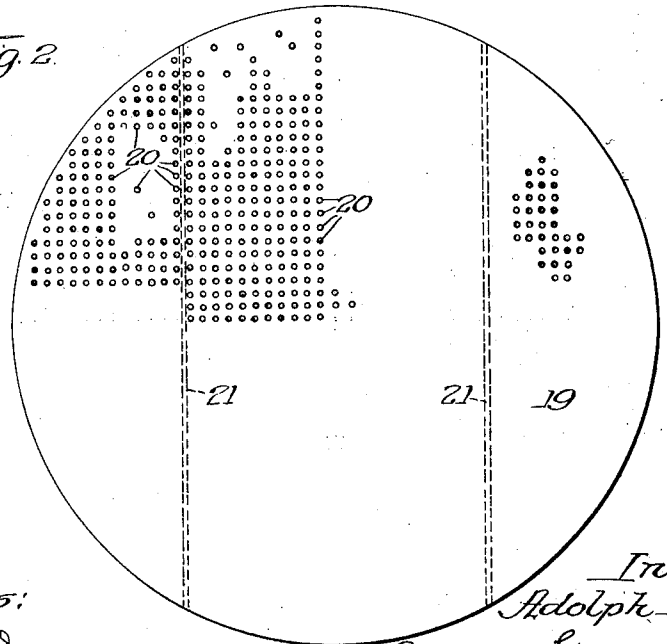


Fig. 2.



Witness:

Inventor
Adolph Heicke

By Cromwell, Greist & Warden
Attys

Aug. 2, 1927. 1,637,377

A. HEICKE

PELLET FORMING APPARATUS

Filed Jan. 22, 1926 2 Sheets-Sheet 2

Fig. 3

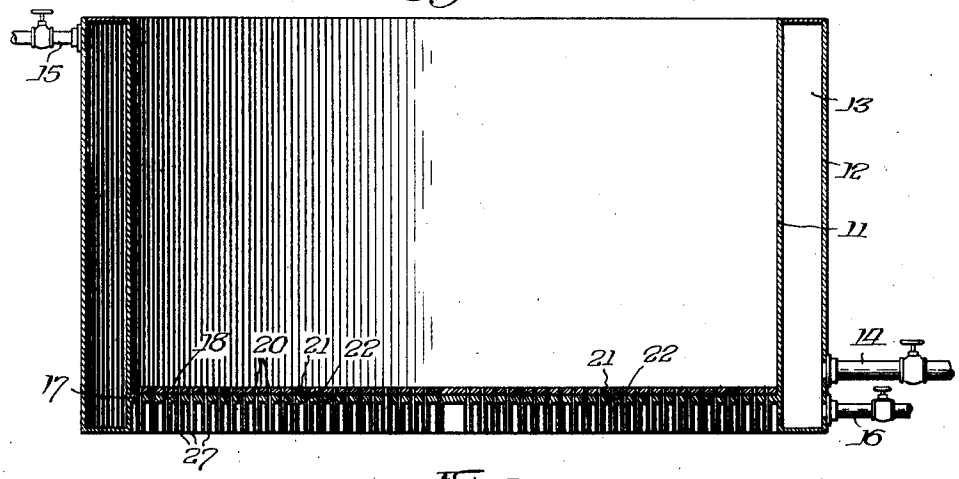


Fig. 4

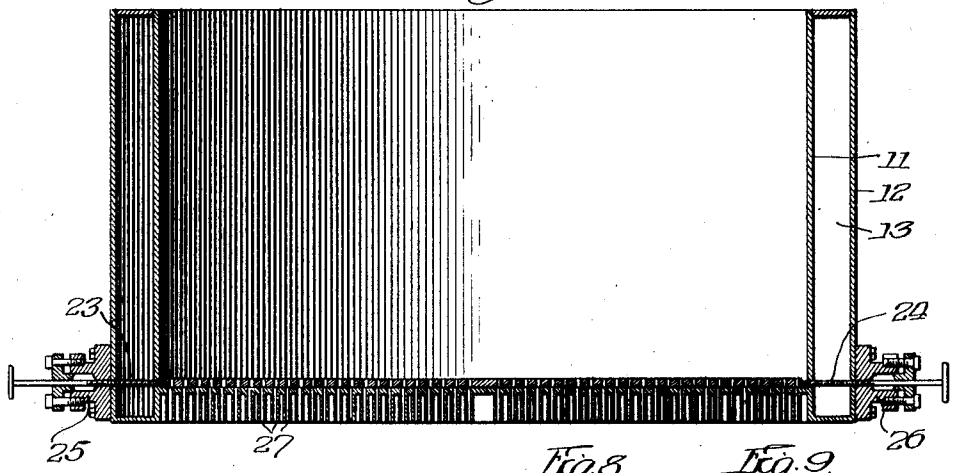


Fig. 5

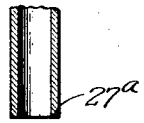


Fig. 6



Fig. 7

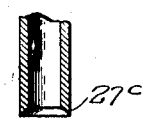


Fig. 8

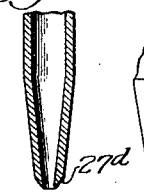
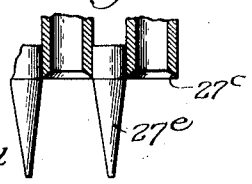
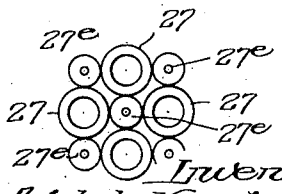


Fig. 9







Witness:

Inventor
Adolph Heicke

By Cromwell Greist Warden
Attys

Patented Aug. 2, 1927. 1,637,377

UNITED STATES PATENT OFFICE.

ADOLF HEICKE, OF CHICAGO, ILLINOIS, ASSIGNOR TO ARMOUR & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PELLET-FORMING APPARATUS.

Application filed January 22, 1926. Serial No. 83,158.

It has been customary to manufacture solid pellets from readily liquefiable materials by dropping the liquid substance in finely divided portions into or through a cooling fluid such as a liquid or a gas. Instances are the manufacture of lead shot and glue pearls or pellets.

The present invention has for its object, the provision of simple, efficient and inexpensive means for effecting uniformity of product regulable as to size; and, while herein set forth as adapted to the manufacture of pearl glue, it is applicable to the forming of pellets from other substances.

In the accompanying drawings one form of the invention is illustrated, although it is to be understood that the apparatus may be modified within a wide range according to the substances to be treated and that the invention as hereinafter defined is not to be construed as limited to the specific embodiment shown and described.

In the drawings:

Fig. 1 is a top plan view of a receptacle, having its bottom perforated;

Fig. 2 is a similar view of a false bottom for the receptacle shown in Fig. 1;

Fig. 3 is a transverse section through the receptacle of Figs. 1 and 2;

Fig. 4 is a similar section taken at right angles to that of Fig. 3; and

Figs. 5, 6, 7, 8 and 9 each constitute a composite disclosure of different forms of nipples in vertical section and bottom plan.

Having reference to the drawings, that form of the device illustrated comprises a receptacle having an inner wall 11 and an outer wall 12 separated to provide an interspace or heating jacket 13. Steam is supplied to the space 13 through the valved pipe 14 and discharged through the valved pipe 15, while the valved pipe 16 serves to draw off any water of condensation. The true or permanent bottom 17 of the receptacle is rendered foraminous by the provision of a large number of apertures 18 arranged at equal distances apart in regular series. The false bottom 19 is provided with similarly arranged apertures 20. The false bottom plate 19 is slightly elliptical in shape so as to permit of its being shifted within the receptacle in one direction to an extent equal to one half the lineal distance between the rows of apertures, whereby to bring the plates into and out of register with the holes of each, providing a through-way, the interspaces between holes in one plate closing off the holes of the other.

To direct the movement of the false plate with reference to the bottom of the receptacle, the former is provided on its under face with grooves 21 adapted to engage over corresponding ribs 22 on the bottom of the receptacle. Relative movement of the plate and bottom is effected by means of the screw spindles 23 and 24 which are mounted in stuffing boxes 25, 26. These spindles are not attached to the false plate but bear against the same from opposite sides as clearly shown in Fig. 4, the backing away of one of the spindles and the advancing of the other causing a corresponding movement of the false plate upon the receptacle bottom.

Suitably mounted upon the bottom of the receptacle in register with the holes 18 and isolated from each other are a series of nipples 27 to which the liquid is supplied through the openings 18 and 20 and allowed to drop from the lower ends into or through any suitable inert cooling medium such as a liquid or gas, to be solidified thereby in spherical form.

In the operation of the device, the material is introduced to the receptacle and maintained in a liquefied condition by the heating agency applied through the jacketed walls. The discharge of the liquid through the apertures 18 and 20 is controlled as may be desired by the screw spindles 23 and 24 so as to permit the liquid substance in regulable quantities to be discharged into the tubes and to drop therefrom, the size of the drops and the resultant pellets being controlled by the positioning of the false plate.

The provision of isolated nipples precludes any spreading of the liquid on the lower surface of the receptacle bottom which might otherwise result from cohesion.

Measurably good results have been attained by the employment of nipples having their lower ends cut across to present a plane surface as illustrated in Fig. 5 at 27^a, but it has been found to be advantageous and conducive to uniformity in product to round off the terminal portions of the nipples to present end surfaces inclined to the horizontal, such as the convex end surface shown in Fig. 6 at 27^b, the concave end surface shown in Fig. 7 at 27^c or the conical end surface shown in Fig. 8 at 27^d.

By providing a circular line of contact last broken when the drop leaves the nipples as distinguished from a circular surface, the drops of liquid tend to uniformity in size, and the size is determined largely by the diameter of the circular line of contact so that the character of the discharge end of the nipple not only tends to produce uniformity in shape, but also assists the liquid feed control in determining the size.

In Fig. 9 is illustrated a modification wherein the terminals of the nipples, having a concave end surface 27^c discharge the liquid laterally to the exterior of solid nipples 27^e disposed between groups of the tubular nipples upon the lower point of which the liquid accumulates in drops and is discharged.

I claim:

1. In a device of the character set forth, a heated receptacle having an apertured bottom, a plurality of isolated tubular nipples each supplied by an aperture, and means to vary the effective size of the apertures.

2. In a device of the character set forth, a heated receptacle having an apertured bottom, means to vary the effective size of the apertures, a plurality of isolated tubular nipples each supplied by an aperture, the terminal discharge portions of the nipples rounded to present end surfaces inclined to the horizontal.

3. In a device of the character set forth, a heated receptacle having a true and false bottom each apertured and mounted for relative movement to vary the effective size of the apertures, and discharge nipples supplied by the apertures whereby the liquid in regulable amount is caused to form on and drop from the nipples.

4. In a device of the character set forth, a heated receptacle having a true and false bottom each apertured and mounted for relative movement to vary the effective size of the apertures, and tubular nipples supplied by the respective apertures, the terminal discharge portions of the nipples presenting end surfaces inclined to the horizontal.

5. In a device of the character set forth, a heated receptacle having relatively movable apertured bottom plates for varying the effective size of the apertures to control the discharge of the liquid through said apertures, and isolated tubular nipples supplied by the respective apertures, the terminal discharge portions of the nipples shaped to present end surfaces inclined to the horizontal, whereby the liquid in regulable amount is caused to form on and drop from the nipples.

6. In a device of the character set forth, a receptacle for the liquid material, a plurality of discharge nipples supplied from the receptacle, and means to regulate the quantity of liquid supply to form drops of predetermined size on the discharge ends of the nipples.

7. In a device of the character set forth, a receptacle for the liquid material, a plurality of discharge nipples supplied from the receptacle, and means to regulate the quantity of liquid supply to form drops of predetermined size on the discharge ends of the nipples, the terminal discharge portions of the nipples presenting end surfaces inclined to the horizontal.

8. In a device of the character set forth, a heated receptacle having an apertured bottom, a plurality of isolated nipples supplied through the apertures, and means to vary the effective size of the apertures.

In testimony whereof I have hereunto subscribed my name.

ADOLF HEICKE.